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INFORMATION REPORT

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PREPARED AND DISSEMINATED BY

CENTRAL INTELLIGENCE AGENCY

COUNTRY: Hungary	50X1-HUM
SUBJECT: Hungarian Power Developments	DATE DISTRIBUTED: 13 Oct 55
	NO. OF PAGES: 6 / NO. OF ENCLS.
	SUPPLEMENT TO REPORT #
	RESPONSIVE TO: OO/C-
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Hungarian Electrification

1. On 10 May 53, a few weeks before the new course was initiated in Hungary, Matyas Rakosi, then Prime Minister, made a speech in which he described the development of the Hungarian economy. He stated, among other things, that in 1960, ie after the completion of the Third Five-Year Plan, Hungarian annual output would reach the following figures:

   (a) Coal - between 40 and 50 million tons
   (b) Steel - three and a half to four million tons
   (c) Electric power - 10 to 12 billion KWH

2. It does not seem possible that such ambitious plans could be realized, particularly in the light of the present production level. According to available data, published by various official sources, the annual output by the end of 1954 was:

   (a) Coal - 19 to 21 million tons
   (b) Steel - 1.5 million tons
   (c) Electric power 4.2 to 4.6 billion KWH

3. Although, in comparison with pre-World War II times, these data no doubt show a rapid rate of development of production, this rate has recently (1953-1954) slowed down. On the one hand, this was the result of the new course policy when the productive investments were limited. On the other, it seems as if, during these years (1953-1954), Hungary had reached a saturation point, after which further development would have proceeded normally and gradually, without the rapid changes that can always be observed when investments are initiated in economically underdeveloped countries.

4. The new government of Hegedus is now trying to return to the productive investment policy, but it is the opinion of nearly all Communist officials, and especially the Hungarian Communist press, that at present the rate of development which was observed from 1947 to 1952 is still far from being reached.

5. One of the branches of the Hungarian economy which should be considered as particularly backward is electrification. Especially in this branch, the Communist plans seem completely unrealistic when they talk of a production of 10 to 12 billion KWH by 1960.

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6. Some of the natural obstacles which hamper the development of Hungarian electrification are:

(a) The lack of suitable coal. Although Hungarian brown coal and lignite can be used for the production of electric energy, they require special adaptation of installations of power stations. Hungarian brown coal and lignite are not only of very low caloric value but they also cannot be transported over long distances. As a result, not only must a special installation be added to the power station, but the power station itself must be located in close proximity to coal mines. As the coal deposits in Hungary are dispersed all over the country, it is almost impossible to concentrate the production of electricity in one region, but it is necessary to disperse the power plants with a rather limited installed power. It is further necessary to construct a dense high-tension line system in order to connect all these dispersed small enterprises and also to connect the points where electricity is produced with consumption centers. Besides coal, natural gas can also be used as fuel for power stations. In the present five-year plan, the first such plant is now under construction in the southwestern Hungarian oil district near Lovaszi. Construction of more such plants are planned if the deposits of natural gas which are dispersed all over Hungary are proved sufficient. For instance, the construction of such a plant near Budapest is now being discussed. Plans are being made to base it on the natural gas deposits near Csomad near Budapest. The estimated gas production from this source is about 300,000,000 cubic meters a year.

(b) The lack of suitable water supplied. Hungarian rivers flow through lowlands and, therefore, it is very hard to make use of them for power stations. There is an additional difficulty in Hungary of subsoil water, which forms a kind of "underground river system". This system is connected with a number of above ground rivers, even with such rivers as the Danube, the Tisza and the Raba. River regulation and amelioration work have resulted, to a certain extent, in bringing the "underground river system" and the above-ground rivers under control. (For instance, there are no more catastrophes or floods from subsoil water which occurred quite often in the last centruy.) Under such conditions, the utilization of a river for the production of electric power requires very costly and complicated installations. The old construction project of the Danube Hydroelectric Plant can be mentioned as an example. This project existed many decades ago. But technical obstacles have always prevented its completion. Raising the level of the Danube can cause the water to sink into the ground not only at the reservoir itself but also far away from it. The former difficulty can be overcome by constructing an impenetrable reservoir. But the connection between the above and below ground rivers in Hungary can very often cause the water to withdraw, even completely, from the reservoir once it has found a connection with an underground river. For instance, the construction of a dam on the Danube north of Budapest can cause the whole Raba valley to be threatened by the withdrawing water. In view of these facts, the project of constructing a hydroelectric station on the Danube is constantly being revised. According to the latest version, it was decided that the power station would be built in the near future north of Budapest in the vicinity of Visegrad.

7. Despite all these natural obstacles, post-World War II Hungary is developing electrification, but not at a rate which keeps pace with the development of other branches of production. Therefore, Hungary still has to import power from abroad. The aluminum enterprises in northwestern Hungary (Almasfuzito and Moson Magyarovar) are supplied with power from Czechoslovakia. 50X1-HUM

collaboration in this field not only will continue, but will also be extended. The network of hydroelectric plants on the Vah river and steam power plants near Bratislava are producing much more electricity than is needed for the Slovak industrial centers along the Vah, leaving the surplus for export. In Prague, plans are also being made to 50X1-HUM construct another very large electric combine on the Danube below Bratislava at the point where the Hungarian, Czechoslovak, frontiers meet. This combine is planned with the idea of creating a central power station not simply for local use but also for inter-state use in Central Europe.

In addition, implementation of the Czechoslovak plan 50X1-HUM needs the approval of the International Commission on Danube Navigation as this plan would have repercussions on the traffic on the Danube. And in this case, it is the voice not only of the Satellite countries but 50X1-HUM also of Yugoslavia which complicates the whole problem considerably.

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8. All these plans for the construction of power plants on the Danube should be considered as the crowning achievement of the electrification of Central Europe. In the meantime, each of the Central European countries is carrying out its own local plan.

9. The Hungarian plan is composed of two parts, which are being carried out simultaneously: (a) the construction of power plants and (b) the construction of a system of uniform high-tension lines (120 kv).

10. In 1946-1947, ie after the partial reconstruction of World War II damages, Hungary possessed:

(a) 1,100,000 KW of installed power in all the power plants of the country. The majority of them were small local enterprises which only seldom supplied electricity to larger areas. The large power plant in the Matra mountains (128,000 KW) was still under construction during the war. A large part of the installation was dismantled shortly after the war by the Soviet authorities and in 1946-47 this enterprise was still under reconstruction. Among the larger power plants the following should be enumerated:

(1) the five power plants in Budapest with a total installed power of about 215,000 KW

(2) the combined power plants in Banhida and Tatabanya with 100,000 KW;

(3) the power plants in the Pecs pit-coal basin with 50,000 KW

(4) the power plant in the Ajka bauxite region with 50,000 KW.

The total average yearly production of all power plants was around 1.6 billion KWH in 1946.

(b) High tension lines of various voltages of 8,100 kilometers. It was characteristic of the World War II system that the more important high-tension lines were tied to the same center, Budapest, without any additional protective lines to be used in case of breakdown. The prewar high-tension network supplied not only large towns and industrial centers, but also a number of rural communities, 875 out of the 3400 which then existed.

11. For new electrical investment, the plans provided for:

(a) in 1947-49 - 200 million forints to supply 2 billion KWH, ie the addition of 70,000 KWH;

(b) in 1950-54 - 3.3 billion forints to produce 4.3 billion KWH, by the addition of 270,000 KWH.

All the above-mentioned data, which were published on various occasions in Hungary, are not sufficient to calculate the cost of one KW of installed power. The above-mentioned funds covered various kinds of investments besides construction or modernization of various types of power plants. They also covered the construction of high-tension lines, of transformer stations and electrification of rural communities. At the same time, other costs of electrification were covered by other sources. For instance, the construction of the large hydro-electric plant near Tisza-Lok was partly included in the large amelioration works in north-eastern Hungarian territory (the so-called Main Eastern Canal, which runs south from Tisza-Lok through the Alfold lowlands).

12. As a whole, the Hungarian electrification plan for the period 1947-1949, 1950-1954 included:

(a) The modernization of a number of existing power plants and the construction of 20 new power plants based on coal, water, or natural gas.

Modernization

(1) The Diosgyor power plant of the steel combine

(2) The Salgotarjan power plant which supplies the coal fields in this area.

(3) The Debrecen power plant

(4) The Kecskemet power plant

(5) The Komlo (75,000 KW) power plant is the modernized and considerably enlarged plant of the Komlo pit-coal area.

(6) The Szombathely power plant which previously supplied 150-volt current has now been converted to the standard 220 volts.

(7) The small Budapest power plant Czaky, with only 10,000 KW has now been adapted to supply central heating.

(8) Satoraljaujhely power plant.

(b) Construction of new plants:

(1) The "November Seventh" Steam Power Plant in Inota, with 120,000 KW of installed power; this power plant, adapted to use very low quality brown coal, is equipped with six turbines of Czech make which previously were intended for Yugoslavia. After Tito's break with the Cominform, all these installations were resold to Hungary. The power plant supplies current to the Inota aluminum plant and to the Lenin Steel Mills in Sztalinvaros with which it is connected by a high-tension line. The power plant has been in operation since the end of 1951, but it has never operated at full capacity because there has always been some kind of breakdown.

(2) The "Matravideki" Steam Power Plant near Lorinei [sic], with 128,000 KW installed power. This power plant, the construction of which was started during World War II, was finished in 1949-50 and has been operating at full capacity ever since. It is equipped with four turbines, one of which is of Hungarian Lang production and three of which are of Swiss Brown Boveri make.

(3) Csepel power plant, with 30,000 KW, constructed as a part of the metallurgical Rakosi Matyas Combine.

(4) The Lovaszi power plant based on natural gas is still not in operation.

(5) Kazincbarcika steam-power plant, with 120,000 KW is still under construction and was planned as a main power center for the Miskolc industrial area. According to information, this plant will be in operation before the end of this year [Sic - 1954 ?].

(6) The Borsod steam power plant, with 150,000 KW installed power, is located near Borsod (the exact location cannot be found). The plant, which is equipped with six turbines and ten boilers, mainly of East German and Czechoslovak make, is still under construction. It will be a supply center partly for the Miskolc industrial area and partly for the Borsod county coal mines.

(7) Tisza-Lok plant, the largest hydro-electric plant in Hungary, is still under construction, for 75,000 installed power. The power plant is situated on the left bank of a new canal which runs about 100 meters parallel to the Tisza River; the dam, which is already finished, raised the water level nine meters. On the right bank of the canal, a 100-meter long sluice is being constructed which will permit passage of barges and steamers of 1000 tons.

(8) The Sztalinvaros steam power plant, with 75,000 KW installed power, which has been completed and is now in full operation, is included in the present Hungarian high-tension line network.

13. The above enumeration of new power plants shows a special concentration on north eastern Hungary, ie in the most important Hungarian industrial center.

14. The electrification plan provides for the construction of two more hydroelectric plants on the Tisza River, one in Tiszapalkonya (50,000 KW) where the preparatory work has already been started, and the second one near Debrecen (50,000 KW) which should be built in the next five-year plan. But the most important investment of this type will be the very large hydropower plant on the Danube, with at least 200,000 KW installed power. According to the latest information, the State Energy Committee in Budapest has decided to construct this power plant north of Budapest near Visegrad and Zebegeny. At this point the Danube makes a U-turn between mountains. Although it is said that this power plant should be built in the next five-year plan, the very high cost of this investment (it is said to be estimated at 10 billion forints) will necessitate its postponement until after 1960.

15. In planning new power plants, a number of very strict regulations and principles must be taken into consideration. In the first place, the site of a plant must be chosen according to three factors:

(a) the proximity of deposits of energy raw materials (low quality coal, natural gas, or water)

(b) the existence of the water supply necessary for the normal functioning of a steam power plant. (There are many places in Hungary where there is no such water supply and where special installations must be made to build a reservoir, as for instance, at the Inota Power Plant);

(c) the proximity of high tension lines. According to the new policy, all new plants, industrial or utilities, must be included in the high-tension line network.

16. In addition, all new power plants must make use of their by-products by, for instance, using waste steam or smoke for heating.

17. In detailed planning of power plants, the plants must be located at some distance from town or residential areas. The direction of the prevailing winds must also be taken into consideration to prevent smoke or coal dust from landing on the city.

18. Power plants must be located also in the vicinity not only of a railroad line but also of a railroad yard so that unloading facilities will be available and a reserve of railroad cars will be secured for coal supplies and to remove slag for road construction.

19. In constructing a new power plant the possibility of enlargement must be foreseen and the land allocated accordingly.

20. In planning the equipment of a new power plant, there is a rule that the machinery must be either produced domestically or, when not available on the domestic market, obtained from the USSR or one of the Satellite countries. Under no circumstances can the machinery be imported from Western countries. This rule very often has delayed the fulfillment of plans. (The electrical equipment industry in all of the Satellites, including Hungary, is overloaded with orders from the USSR, which always have first priority. This situation exists in the production of machinery, electrical installations and all kinds of spare parts. For about two years now second priority has been given to orders from Red China. Since the USSR is unable to fill all orders from Red China, it passes them on to the Satellite countries.)

21. Among the more important industrial enterprises which produce electrical machinery and equipment, the following should be mentioned:

(a) Langgepgyar - the former Lang Metallurgical Plant on Vacci Ut in Budapest, which specializes in the production of turbines and boilers.

(b) Kazan Epito Vallalat, an enterprise in Budapest (no exact address is available) which specializes in the production of boilers.

(c) "Fourth of April", the pre-World War II Roeck plant, in Budapest, on Fehervary /sic/ Ut which, besides its main production of agricultural machinery, also produces electrical motors and aggregates.

(d) Szellozo Muvek, in Budapest, in the suburb of Kelenfold, a plant which produces ventilators.

(e) Ganz in Budapest (in the Buda section), a plant which specializes in the production of generators and transformators.

(f) The pre-World War II Ganz concern, now independent, (new name unknown); an electrical installations plant, which produces equipment mainly from prewar Brown Boveri patents; it also produces electrical measuring instruments.

(g) Meromuszerek Gyar, a newly constructed plant in the Zuglo district of Budapest which specializes in the production of fine electrical appliances, voltmeters, and other electrical measuring instruments.

(h) "Transzvill", the pre-World War II AEG plant, at 2A Hunn Ut, Budapest, which specializes in the production of transformers and other electrical equipment.

(i) Kabelgyar in Budapest, on Budafoki Ut, which produces various kinds of cable and insulating wire.

(j) A cable production plant (exact name unknown).

(k) "B V K" (Budaji Villamosgep Es Kabel Gyar) in a southeastern suburb of Budapest, a plant which specializes in the production of electrical machinery.

(l) "Zsolnay" in Pecs, a pottery plant where in 1952 and 1953 a new department was put into operation to produce insulators.

(m) "Herend", the most famous and traditional Hungarian procelain factory in Herend. After World War II, industrial production was introduced in this factory where, besides technical porcelain, insulators are produced.

(n) An insulator factory (exact name unknown) in Kobanya, a suburb of Budapest.

Of all these enterprises, the most important is the Lang Plant which is the only one in Central Europe, other than the Czechoslovak Skoda Plant, which produces large turbines. There are also some smaller factories which produce electrical equipment as side products.

Development of the High-Tension Line Network

22. As has already been mentioned, the main aim of this system is not only to extend the high-tension line network but also to remodel the system by adding special protective lines for emergencies. Since this project is very complicated and costly, the Budapest center is still operating as the key point, but it has been modified so that the electric system has been divided into two interconnected but independent parts, one for the northern half of the country (based on the Ujpest power plant - 45,000 KW - on Megyery Ut) and the other for the southern half (based on Kelenfold power plant - 100,000 KW).

23. The new high-tension line network (120 KW) covers the western part of Hungary with a branch-off to the Miskolc industrial region. The network will be extended in the next Five-Year Plan, but this depends on the construction of two projected hydroelectric power plants, one on the Danube and the other on the Tisza River. Only after the realization of these two projects will the whole country be covered by the necessary network, to which the local networks (with lower voltages) will be connected. There are a number of such local networks in various parts of Hungary; some of them are quite important and cover large areas. Among them are;

(a) In western Hungary, the local high-tension line base on the hydroelectric power plant Ikerver on the Raba River (30,000 KW). The Szombathely power plant is connected to this high-tension line. The line runs east to the Sumeg area, where it supplies power to the Nyirdi Erdo bauxite mines.

(b) In southeastern Hungary, the high-tension line which is mainly based on the steam power plant in Bekescsaba. This line, which reaches Mozebereny /sic/ in the north, runs as far south as the Yugoslav frontier, supplying power to the agricultural area of Bekes County.

24. All such local lines will be included in the national high-tension line system in the next Five-Year plan.

25. The whole electrification program in Hungary is worked out and controlled by a number of special institutes and planning offices. The most important of all of these is the State Energy Committee, located at 14 Iskola Ut, Budapest 11. This committee (ETI) which is composed of delegates from the Central Economic Planning Board and representatives of various ministries and scientific research institutes makes the general policy decisions for investment and consumption of power.

26. After an ETI decision has been made, the more detailed instructions are drawn up by the Central Economic Planning Board, which is also responsible for the financial side.

27. The detailed plans are drawn according to the work of the following planning and research institutes, depending on the kind of work involved:

(a) Eromu Tervezo Iroda - power stations' planning office, located at 3 Szechenyi Rokpart, Budapest V. This institute is headed by Professor Andras Levai, of Budapest Polytechnic, who is one of the top experts in electricity in Hungary;

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(b) Hotechnikai Tervezo Iroda - hydro-power plants' planning office, located at 5 Bathory Ut, Budapest V, under the direction of Professor Laszlo Heller, of Budapest Polytechnic,

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(c) Hotechnikai Kutato Intezatnck a thermotechnical research institute under the direction of Professor Zoltan Komondy of Budapest Polytechnic. This institute is located at Bertalan Ut, Budapest XI.

(d) Budapest Muszaki Egyetem Vizgepek Tanszeke Es Kutato Instezete, Hydraulic Machinery Department and Research Institute of Budapest Polytechnic, headed by Professor Geza Pattantyus. The institute is located on Stoczek Ut, Budapest XI.

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